

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATIONS**

RIPARIAN FOREST BUFFER

(Acre)
CODE 391

GENERAL SPECIFICATIONS

Procedures, technical details and other information listed below provides additional guidance for carrying out selected components of the named practice. This material is referenced from the conservation practice standard for riparian forest buffer and supplements the requirements and considerations listed therein.

Conservationists will use professional judgement when deciding which areas are suitable for treatment. Safety is of primary importance. Also conservationists are to account for deflected flows from planned treatments. Under no circumstances will water be discharged in a damaging or unsafe manner. Also water discharges onto adjoining landowners will not be altered without written permission of that effected entity.

NATURAL REGENERATION

Some riparian areas can become stable through natural regeneration of the existing plants as long as there is an adequate density and the plant vigor is such that there will be adequate plant survival. If the vegetation in Zone 1 and Zone 2 meets the following criteria, natural regeneration is an option:

- Plants, must be native trees or shrubs, adapted to the area
- Have a density of 300 plants per acre (3 per 1/100 acre)
- Plants are at least 2 feet tall and in good health

Sampling of riparian vegetation can be done a variety of ways that accurately evaluate the plant densities. One method is to mark the perimeter of a 1/100-acre circular plot (approximately 12 feet in radius) and count all desirable woody plants. If

the area of consideration is >100 ft. in length, several sites must be sampled and summarized to determine if the 300 plant per acre criteria is met.

MANAGEMENT

Refer to the Use Exclusion (472) standard and specification when exclusion of animals, people and vehicles is needed. Thereafter, use of the area should be limited to those activities that will maintain or improve the riparian plant community. Invasive and/or non-native plants shall be removed as feasible. Refer to other standards and specifications such as Brush Management (314), Stream Crossing (728), Fence (382), Pipeline (516), and trough or tank (614) as needed.

PLANT LIST

Table 1 lists woody plant species (trees and shrubs) commonly associated with and suited to riparian areas. Species are arranged alphabetically by management zone. (See practice standard for explanation of management zones)

Tree/Shrub Species	Zone
ash, Arizona	1, 2
birch, river	1
blacklocust	1, 2
boxelder	2
buckbrush	1, 2
buttonbush	1
cherry, black	2
cottonwood	1, 2
dogwood	2
elm, lacebark	1, 2
hackberry	2
hawthorn	2

Tree/Shrub Species	Zone
maple, Rocky Mtn.	1
oak, chinkapin	2
oak, gamble	2
pecan	2
pine	2
plum	2
soapberry	1, 2
sumac	2
sycamore	1, 2
willow, black	2
willow, coyote	1, 2

Conservation practice general specifications are reviewed periodically, and updated if needed. To obtain the current version, contact the Natural Resources Conservation Service.

PLANTING DENSITIES

Initial plant-to-plant densities for trees and shrubs will depend on their potential height at 20 years of age. Heights may be estimated based on: 1) performance of the individual species (or comparable species) in nearby areas on similar sites, or 2) predetermined and documented heights using Conservation Tree/Shrub Suitability Groups, Section II of the Field Office Technical Guide. See the following table for Tree and Shrub Planting density specifications.

Plant Types/Heights:	Plant-to-Plant Spacing in feet:
• Shrubs less than 10 feet in height	3 to 8
• Shrubs and trees from 10 to 25 feet in height (includes columnar trees)	6 to 10
• Trees greater than 25 feet in height	8 to 18

The table can be used to determine proper planting densities. The plant to plant spacing is to be applied as a grid. For example for a Coyote Willow that is expected to be less than 10 feet high at maturity allow a maximum of 8 feet in any direction between it and the next Coyote Willow. For situations where two different plant type/height classes are to be planted next to each other use the greater distance as the spacing. An example would be planting Coyote Willow in one row and Fremont Cottonwood in the next row. In that case use a maximum of 8 feet between the willows and a maximum of 18 feet between the cottonwoods and the willows and also between each cottonwood.

Plant stock only in areas that will provide suitable habitat for that species. For example if the physical management zone 1 for a stream reach is 8 feet wide or less then there will only be room for one row of plantings. This is typical where a channel is deeply incised and very little flood plane exists. It is generally recommended to concentrate plantings on point bars and other

stream areas where the flood plain is wider and more plants will have a chance to get their roots down to ground water.

Plantings will be judged to be adequate when 80% of the planted species are growing and thriving two years after planting. For example if plants are planted on an 18 X 18 foot grid that would yield a density of 134 plants per acre. 80% of 134 would be 107 plants per acre still growing within 2 years of planting.

Conservationists will use professional judgement when deciding which areas are suitable for planting. Safety is of primary importance. Also conservationists are to account for deflected flows from planned vegetation. Under no circumstances will water be discharged in a damaging or unsafe manner. Also water discharges onto adjoining landowners will not be altered without written permission of that effected entity.

CARE, HANDLING, SIZE AND PLANTING REQUIREMENTS FOR WOODY PLANTING STOCK

Planting stock will be stored in a cool, moist environment (34-38 degrees F) or heeled in for long term storage. During all stages of handling and storage, keep stock tops dry and free of mold and roots moist and cool. Destroy stock that has been allowed to dry, to heat up in storage (e.g., within a bale, delivery carton or container), or that has developed mold or other pests. Live cuttings that will not be immediately planted shall be promptly placed in controlled storage conditions (34-38 degrees F) for long term storage and protected until planting time.

For cuttings, the selected material must be vigorously growing and a minimum 2 years old to assure the material is woody. All live cuttings must be taken during the dormant season. Tops should be cut off with apical buds, remove side branches, and produce lengths long enough to reach adequate soil moisture required by the individual species during the growing season. Most species suitable for planting of cuttings or poles must be planted to a depth of permanent

water or will require temporary water until the root system develops down to permanent water. Tops of collected cuttings may be dipped into latex paint, paraffin or sealing wax to prevent desiccation and mark the up-end. Dormant cuttings of many species, particularly cottonwood and willows, may be stored with the butt end submerged in water until planting, which must be prior to the buds breaking. At a minimum, the butt end must be kept cool, dark and moist until the stock is planted.

Seedlings shall not be less than 1/4" in caliper at 1" above the root collar. Rooted planting stock must not exceed a 2:1 shoot-to-root ratio. Preferable shoot-to-root ratio for the New Mexico environment is 1:1. See figure 1. Container stock shall normally not exceed a 1-gallon or 40 cubic inch size. Minimum container size for rooted seedlings should be 7 cubic inches.

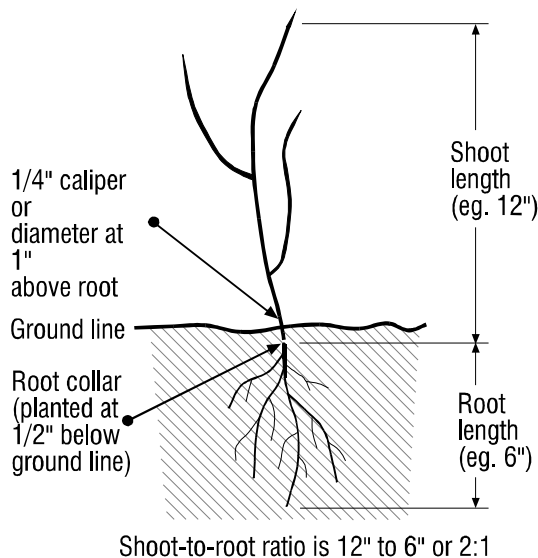


Figure 1. Plant or stock size requirements.

Roots of bareroot stock shall be kept moist during planting operations by placing in a water-soil (mud) slurry, peat moss, super-absorbent (e.g., polyacrylamide) slurry or other equivalent material. Rooting medium of container or potted stock shall be kept moist at all times by periodic watering. Pre-treat stored cuttings with several

days of soaking just prior to planting. Stock shall not be planted when the soil is frozen or dry. Rooted stock will be planted in a vertical position with the root collars approximately 1/2-inch below the soil surface. Insert cuttings to the depth required to reach adequate soil moisture with at least 2-3 buds above ground. The planting trench or hole must be deep and wide enough to permit roots to spread out and down without J-rooting or L-rooting. After planting of rooted stock or cuttings, pack soil around each plant firmly to eliminate air pockets. See figure 2.

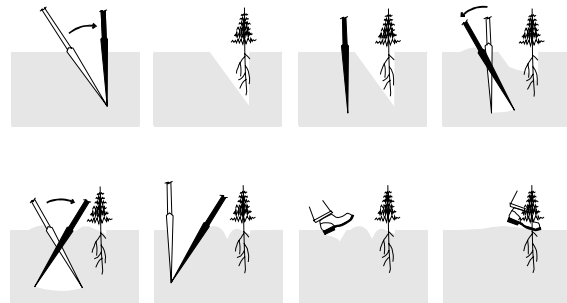


Figure 2. Proper plant and root placement of rooted stock using a planting bar.

Planting of cuttings and poles.

For planting of cuttings where no supplemental water is planned, the site must be evaluated for the maximum depth of the water table. Any cutting must be long enough to reach that maximum water table depth and have a minimum of 3 buds above the ground level.

In areas where this exceeds the normal tree planting depth, a hole must be dug for each individual cutting. This is often best accomplished with mechanical means but can be done by hand. In cases where the soil is extremely moist and there is no rock or other impeding layer and the water table is near the surface year round, the cutting can be pushed into the soil to the necessary depth. The entire length of holes dug for cuttings must be filled with soil after planting.

Where supplemental water is provided to cuttings that are not established in a permanent water table, the cuttings must have a minimum of 6 inches in the soil and a minimum of 3 buds above the ground. Cuttings more than 2 feet long will

have to have at least 1/3 of the total length in the soil to support the top growth. Supplemental water will be required to provide moisture for the entire depth of the cutting. This may be required for the life of the plant or until the root system can reach the maximum depth of the water table.

Please refer to and follow the latest New Mexico planting specifications. Applicable reference material includes but is not limited to Biology Tech Notes 35,40, and 42. Engineering Field Handbook (part 650) Chapters 13 “Wetland Restoration, Enhancement or Creation”, 16 “Streambank and shoreline Protection” and 18 “Soil Bioengineering for Upland Slope Protection”.

BUFFER WIDTH GUIDE FOR SELECTED WILDLIFE SPECIES

Widths below include the sum of buffer widths on one or both sides of water courses or water bodies and may extend beyond riparian boundaries (in such cases refer to the practice standard for Tree/Shrub Establishment, practice number 612, in the FOTG for design information on upland forests).

Species:	Desired Width in feet:
• Bald eagle, cavity nesting ducks, heron rookery, sandhill crane	600
• Common loon, pileated woodpecker	450
• Beaver, dabbling ducks, mink, salmonids	300
• Deer	200
• Lesser scaup, harlequin duck	165
• Frog, salamander	100

PREPARATION OF PLANTING SITES

Planting sites shall be properly prepared based on the soil type and vegetative conditions listed below. For sites to be tilled, leave a 3-foot

untreated strip at the edge of the bank or shoreline. Avoid sites that have had recent application of pesticides harmful to woody species to be planted. If pesticides are used, apply only when needed and handle and dispose of properly and within federal, state and local regulations. Follow label directions and heed all precautions listed on the container.

Fabric mulch may be used for weed control and moisture conservation for new plantings on all sites, particularly those with pronounced growing season moisture deficits or invasive, weedy species. Refer to Mulching, Practice Standard number 484 in the FOTG, for installation procedures.

Based on site conditions and predominant soil texture of the fine earth fraction, procedures include the following: (Whenever a non-selective herbicides is mentioned the chemical Glyphosate is a contact only, non-selective, no residual herbicide that meets this requirement.) (Rodeo is a selective herbicide that is registered for use in and around riparian areas. It is effective on problem phreatophytes.) (The mention of product names in no way indicates an endorsement by NRCS.)

Tillable sites with loamy/clayey soils

- Sod and alfalfa sites

Summer fallow 1 year is preferred to kill the sod or alfalfa. Till 1/ in the spring before planting the stock. A fall-sown crop of oats may be used where needed to control erosion.

Sod may be killed by non-selective herbicides the year previous to planting stock 2/. Plant stock in the residue. On heavy soils, tillage is usually necessary to achieve a satisfactory planting when a tree planting machine is used.

- Small grain or row crop sites

If the site is in row crop, till 1/ in the fall or in the spring prior to planting the trees or shrubs. If the site has a plow or hard pan in subsoil, perform a deep disking or ripping operation in the fall. A fall-sown crop of small grains may be used where needed to control erosion.

If the site is in small grain stubble, the stock may be planted in the spring without further preparation. If fabric mulch is to be installed, till in the spring prior to planting.

Tillage on steep slopes must be on the contour or cross-slope. A cover crop between the rows may be necessary to control erosion and sediment deposition on planted stock.

Tillable sites with sandy soils

- Sod and alfalfa sites

Till 1/ and plant to a spring cover crop the year prior to planting. Leave a stubble cover in which to plant. A light disking may be needed before planting if fabric mulch is used.

Sod may be killed by non-selective herbicides the year prior to planting 2/. Plant trees or shrubs in the residue.

When hand planting, scalp or strip an area at least 3 feet in diameter and two-to-four inches deep. (place plants in the center of the scalped area.)

Rototill a 3-foot wide strip. (Place plants in the center of the tilled area.) Where a drip watering system will not be used, rototill the strip the year prior to planting.

Tillable sites with sandy soils

- Small grain or row crop sites

If the site is in small grain, corn, or similar clean tilled crop, and it is reasonably free of weeds, plant stock in the stubble without prior preparation. It may be necessary to till a narrow strip with a disk or other implement to kill weeds or volunteer grain, or to prevent stalks and other residue from clogging the tree planter. If fabric mulch is used, disking may also be needed. A cover crop or stubble may be needed between the rows to protect the planting from water or wind erosion.

Non-tillable sites and/or erosive sites (including sites with undesirable brushy or herbaceous species)

On sites where it is not practical or possible to operate equipment (steepness, rockiness, etc.), where tillage of the site will cause excessive erosion, or where tillage of the site is impractical, the methods listed following may be used. Sites with undesirable brush will need initial treatments that physically removes and kills the brush species to facilitate planting of desired stock and prevent encroachment of the brush back into the site. Suitable methods include hand-cutting and removal, brush hogging, brush-blading, or other equivalent procedure with repeated treatment or use of herbicides to control resprouting.

Machine or hand scalp an area at least 36 inches in diameter with subsequent plant placement in the center of the scalped area.

Rototill a strip at least 36 inches wide the year prior to tree planting with subsequent plant placement in the center of the tilled strip.

Kill the vegetation in a 36-inch diameter or larger area or in a 36-inch or wider strip with a non-selective herbicide the year prior to planting and plant in the center or along the center-line of the treated area.

Riparian sites with existing vegetation where additional plants or species are to be planted.

Tree or shrub plantings must have woody competition controlled for the planned crown spread of the planting. Tillage or chemicals shall be used to control all herbaceous vegetation for a minimum of 36 inches on all sides of the planting. If problem phreatophytes (like saltcedar) are located on the site, those plants should be controlled to the extent that none of their roots or new seedlings will interfere with the development or growth of the planted species. Problem Hydrophyte species located on the site (like cattails) may need to be managed to allow for favorable site conditions for the growth and development of the plantings.

OPERATION AND MAINTENANCE

Management of Competing Vegetation for areas being established as new buffer plantings.

Specification - 391-6

The area will be inspected at least annually for the presence of noxious plants. Noxious plants will be managed with in the requirements of parts A. and B. that follow.

A. On soils which are not susceptible to severe wind or water erosion competitive vegetation shall be controlled by the following alternative methods.

Clean cultivation with a spring tooth harrow, sweep chisel plow (duckfoot), disk (tandem disk only), shovel cultivator, or other tillage implement.

Tillage depth would be two to four inches to avoid damage to tree roots and no closer than six inches to any desirable plants.

Plant annual cover crops of grain sorghum, oats, corn, forage sorghum, etc. If perennial grasses are used, only short non-rhizomatous grasses will be allowed. An exception is western wheatgrass which is a rizomatous species that makes a good cover.

Approximately 4 feet should be left between the cover crop and the trees.

In some cases, chemicals may be used on the entire buffer area to control competitive vegetation. If this method is used, caution must be taken to avoid erosion and concentration of chemicals in runoff. 2/

Hand hoeing.

Tractor mounted row hoes or weed badgers.

Over the row cultivation with a flexible tine or finger type weeder, effective only when weeds are very young such as the two leaf stage.

Chemical weed control in a 1.5 to 3 foot band adjacent to each side of the trees or shrubs approximately once each month during the growing season, or use of soil applied herbicides. 2/

A rototiller may be used, but not more than 4 inches deep.

Polypropylene fabric mulch must be at least 6 feet wide.

B. On sites prepared prior to tree planting, where severe wind or water erosion is a hazard or where tillage was not possible, competitive vegetation shall be controlled by the following methods.

Cover crops of grain sorghum or forage sorghum or other adequate cover crops should be maintained in the area between trees. If perennial grasses are used, only short non-rhizomatous grasses will be allowed.

Approximately 4 feet should be left between the cover crop and the trees.

For sites that are not clean tilled or with herbaceous cover, mow between trees approximately once each month during the growing season.

Hand hoeing.

Tractor mounted row hoes or weed badgers.

Over the row cultivation with a flexible tine or finger-type weeder, effective only when weeds are very young such as the two leaf stage.

Chemical weed control in a 1.5 to 3 foot band adjacent to each side of each plant approximately once each month during the growing season, or use of soil applied herbicides. 2/

Polypropylene fabric mulch must be at least 6 feet wide.

Protection from Animal Damage

The best defense is maintaining good weed control around plants to reduce rodent habitat. Rodents are most dangerous to new plantings until the trees and shrubs are three to four years old. An exception to this are Beavers. Beavers prefer young trees, however, they will also down mature trees. Poultry wire wrapped 6 feet up the trunk is an effective defense. Control mice, gophers and other undesirable rodents by the use of poison baits. Mouse baits should be placed in tin cans nailed to a board. Gopher baits are best placed with a machine of the "gopher getter" type. Follow pesticide directions and heed all precautions on the container label. If they are not handled properly or if unused portions are

disposed of improperly, they may cause injury to humans, animals, fish and other wildlife, desirable plants, honey bees and other pollinating insects, and may contaminate water supplies.

Physical Barriers will deter grazing and browsing of plant materials. Acceptable material includes chicken wire with a mesh that does not exceed 1 inch will be shaped to form a cylinder a minimum of 5" in diameter and 18" in height. A minimum of 1 24 inch 1'X2" stake with 18 inches extending above the ground will be used to support the chicken wire. The chicken wire will be fastened to the stake by 2 evenly spaced staples or 2 wire ties. The bottom the cylinder will be flush with the ground. The barrier must be removed when the trunk diameter is within ½ inch of the chicken wire diameter.

Another acceptable physical barrier includes rigid polypropylene mesh tubes. Tubes will be of a diamond pattern with a minimum 30 mil standard diameter. The tubes will be a minimum of a 5-inch diameter and 18 inches high. The tubes will be fastened to a 24" long 1" X 2" stake with 18 " extending above the ground. Attachment will be with a single wire tie or staple. The bottom the cylinder will be flush with the ground.

Watering Requirements - All Species

Supplemental water must be considered for almost all species on all sites where the species root growth is not expected to reach the permanent water level within one year. This will be required in case of drought and for the plants to reach their full potential. All trees and shrubs, even that native to an area, are susceptible to extended droughts. Water will have to be considered for the dormant season since severe droughts during this period can have a significant

impact on tree health. Do not water during the dormant season if the ground is frozen since the water will not soak into the ground and water lines may be frozen.

An exception to required supplemental water for riparian plantings is in the area where the planted species do grow naturally to their full potential. Plantings with adaptable native plants and satisfactory mulch may also be exempt from supplemental water requirements on most sites.

Irrigation intervals will lengthen as new plantings age and develop a deeper and more extensive root system. Set time must also increase to accommodate an increasing demand for water at greater depths.

Soak the soil profile within the drip line of the plants thoroughly to a depth of 3 to 5 feet and do not irrigate again until the profile has drawn down to 50 to 60 percent of available water holding capacity. This will require adding drip lines or increasing the area of flooding as the trees mature to provide water for an increasing root zone. For columnar trees the root system develops well outside the drip line and watering will have to be adjusted to account for this.

If a polypropylene fabric mulch is used for weed control and moisture conservation, the amount of supplemental water needed may be reduced. The amount of reduction may be up to 50% with confirmation by field check to determine effectiveness of the mulch. Care must be taken to not over water, which can drown out the roots and kill some plants.

All practices and procedures that involve ground disturbing activities will be in compliance with applicable Cultural Resource Protection laws, regulations, and policies.

Footnotes

1/ The term "till" includes the use of moldboard plows, disk plows, roto tillers and similar equipment.

Specification - 391-8

2/ CAUTION: “Weed and Brush Control” by NMSU will be used for all herbicide recommendations. If pesticides are used, apply only when needed and handle with care. Follow the directions, and heed all precautions on the container label. If the pesticides are not handled or applied properly, or if unused portions are disposed of improperly, they may cause injury to humans, animals, fish and wildlife, desirable plants, honey bees and other pollinating insects, and may contaminate water supplies.

Specification - 391-9

Scientific Name	Common Name	Growth Form	Shade Tolerance	Shade Value	Nutrient Uptake	Inundation Tolerance	Soil Saturation Tolerance	Drought Tolerance	Aesthetics	Native Species	Sediment Deposition Tolerance
Atriplex canescens	4-Wing Salt Bush	Shrub	M	L	M	M	M	H	H	Y	H
Hymenoclea monogyra	Burrobrush	Shrub	M	M	M	M	M	H	M	Y	H
Celtis occidentalis	Hackberry	Tree	H	L	M	M	M	H	H	Y	M
Sapindus saponaria	Soapberry	Shrub	M	M	M	M	M	H	M	Y	H
Ceratoides lanata	Winterfat	Shrub	M	L	M	M	M	H	H	Y	H
Rosa woodsii	Woods Rose	Shrub	H	L	M	M	M	H	H	Y	M
Fallugia paradoxa	Apache Plume	Shrub	M	L	M	M	M	H	H	Y	H
Fraxinus pennsylvanica	Arizona Ash	Tree	M	M	M	M	M	M	H	Y	L
Juglans major	Arizona Black Walnut	Tree	M	M	M	M	M	M	H	Y	M
Platanus wrightii	Arizona Sycamore	Tree	M	M	M	M	M	M	H	Y	M
Populus tremuloides	Aspen	Tree	L	M	H	H	H	M	H	Y	H
Salix bebbiana	Beaked Willow	Tree	M	H	H	H	H	M	H	Y	H
Acer gracidentatum	Bigtooth Maple	Tree	M	H	M	L	L	H	H	Y	M
Robinia pseudoacacia	Black Locust	Tree	M	M	M	M	M	H	H	Y	L
Picea pungens	Blue Spruce	Tree	M	M	M	M	M	H	H	Y	L
Salix irrorata	Bluestem Willow	Tree	M	H	H	H	H	M	H	Y	H
Acer negundo	Box Elder	Tree	M	M	M	M	M	M	H	Y	L
Prunus virginiana	Chokecherry	Tree	M	M	M	M	M	M	H	Y	M
Salix exigua	Coyote Willow	Tree	M	H	H	H	H	M	H	Y	H
Chilopsis linearis	Desert Willow	Tree	L	M	M	M	M	H	H	Y	L
Populus fremontii	Fremont Cottonwood	Tree	H	H	M	H	H	M	H	Y	H
Quercus gambelii	Gambel Oak	Tree	L	M	M	M	M	H	H	Y	L
Ribes aureum	Golden Current	Shrub	H	L	M	M	M	H	H	Y	M
Alnus tenuifolia	Mountain Alder	Tree	M	M	M	M	M	M	H	Y	L
Populus angustifolia	Narrowleaf Cottonwood	Tree	H	H	M	H	H	M	H	Y	H
Prunus americana	Native Plum	Tree/Shrub	M	M	M	M	M	M	H	Y	M
Alnus oblongifolia	New Mexico Alder	Tree	M	M	M	M	M	M	H	Y	L
Robinia neomexicana	New Mexico Locust	Tree	H	L	M	H	H	M	H	Y	H
Forestiera neomexicana	New Mexico Olive	Tree	H	L	M	H	H	M	H	Y	H
Pinus edulis	Pinyon Pine	Tree	L	M	M	M	M	H	H	Y	L
Pinus ponderosa	Ponderosa pine	Tree	M	M	M	M	M	H	H	Y	L
Juniperus scopulorum	Rocky Mountain Juniper	Tree	M	M	M	M	M	H	H	Y	L
Salix scouleriana	Scouler Willow	Tree	M	H	H	H	H	M	H	Y	H
Rhus trilobata	Skunkbush Sumac	Tree/Shrub	M	L	L	H	H	M	H	Y	M
Salix bonplandiana	Toumey Willow	Tree	M	H	H	H	H	M	H	Y	H
Fraxinus velutina	Velvet Ash	Tree	M	M	M	M	M	M	H	Y	L
Salix goodingii	Western Black Willow	Tree	M	H	H	H	H	M	H	Y	H
Abies concolor	White Fir	Tree	H	M	M	M	M	M	M	Y	M

EXPLANATION OF TERMS - TABLE 1.

Species are grouped by plant type and arranged in alphabetical order by common name. Heights are listed for applicable MLRA's (Major Land Resource Areas, USDA Ag. Handbook 296, Dec. 1981) and precipitation zones. Heights and attributes represent expected performance and characteristics of the individual plant at the reference age in dominant canopy positions on medium-textured, non-saline, neutral pH soils. The reference age for trees is 20 years of age. The reference age for shrubs is 10 years.

Attributes: (codes include H = High, M = Medium, L = Low, Y = Yes, N = No, with special notes about individual species denoted by a letter, e.g. "a")

1. Shade Tolerance. The plant's capacity to grow in a shaded condition. H = can grow in the shade of an overstory; M = can grow in partial shade; L = needs full or nearly full sunlight.

2. Shade Value. The density or fullness of shade provided by an individual plant's crown in a full leaf-out condition. H = provides full shade; M = a partially open crown that provides patchy or incomplete shade; L = a very open crown that provides little shade.

3. Nutrient Uptake. The plant's general capacity to use excess nutrients such as nitrate-nitrogen. H = can use large amounts; M = some excess nutrients used; L = plant is a low-nutrient user.

4. Inundation Tolerance. General capacity of the plant to withstand standing water, low soil aeration conditions. H = can tolerate 5 or more days of inundation; M = can tolerate 2-5 day events; L = can tolerate 1-day or less of inundation.

5. Soil Saturation Tolerance. The plant's capability to grow in near or saturated soil conditions. H = plant can withstand "wet feet;" M = some tolerance to saturated conditions; L = little or no tolerance of water-saturated soil.

6. Drought Tolerance. The plant's capability to grow in droughty or dry soil conditions. H = plant can withstand or has physiology to survive

droughty periods; M = some tolerance to drought or dry conditions; L = little or no tolerance of dry soil conditions.

7. Aesthetics. A very general rating (H, M or L) that indicates some aspect of the plant, e.g., flowers, special foliage characteristic, or plant part color, that enhances the appeal or viewing of the planting.

8. Native Species. Y indicates the plant is native to the state; N indicates it is introduced.

9. Sediment Deposition Tolerance. H = plant can withstand repeated, deep deposits of sediment; M = plant can withstand repeated, shallow deposits of sediment; L = plant can withstand little or no sediment deposits.

10. Special Notes.

a. Species tolerate a relatively wide range of soil conditions including pH's less than 8.0 and saline conditions generally less than 4 mmhos/cm.

b. Species tolerate a wide range of soil conditions including pH's of up to 9.0 and saline conditions of up to 16 mmhos/cm.

c. Species tolerate a wide range of soil conditions including pH's of up to 9.0 and saline conditions of greater than 16 mmhos/cm.